ARUP

Memorandum

To	Anna Limnios
Date	04 April 2025
Copies	Adam Marshall, Lauren Boysen
Reference number	298160-00
From	Sina Hassanli
File reference	
Subject	o State Design Review Panel

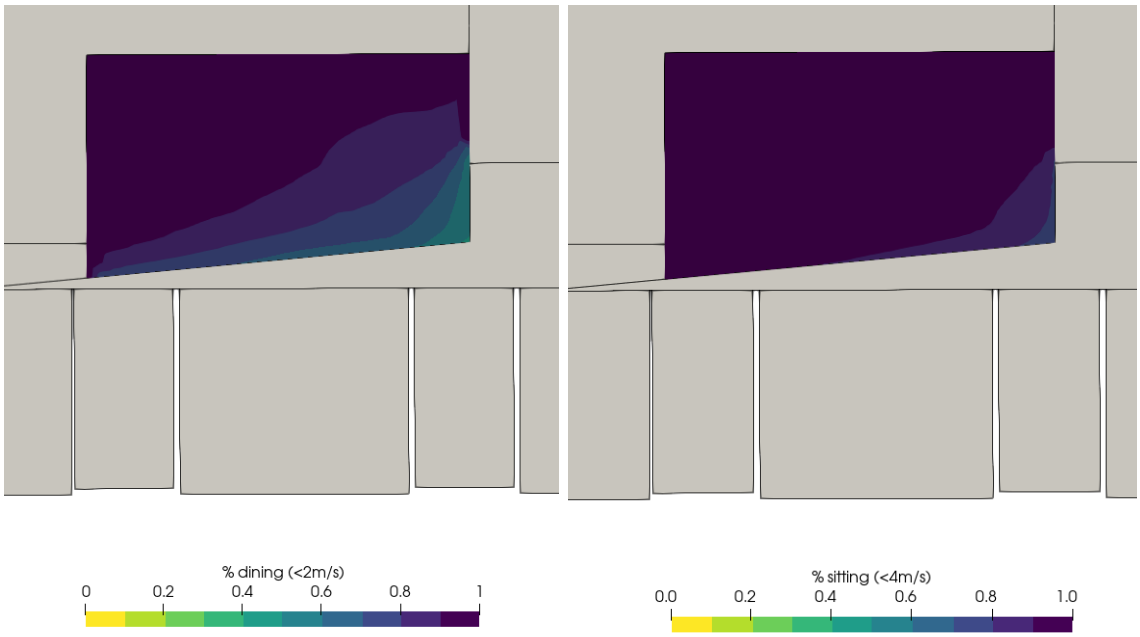
Herein, please find a concise summary addressing the comments provided by the State Design Review Panel (SDRP) in their design review 5 relating to the Environmental Wind Assessment Report for Crows Nest OSD – Site B (Revision 5, dated 11 March 2025).

Item 3

The wind report presents the wind conditions for the upper-level balconies in Figure 21, and for the mid- and lower-level balconies in Figures 39 and 40 (Appendix), respectively. Upper-level balconies are generally subject to higher wind speeds due to reduced shielding from surrounding structures and elevated exposure. As a general guideline, balconies should be designed to achieve *sitting* or *standing* (depending on its location) or better wind conditions across the majority of their floor area, with no areas classified as uncomfortable.

The analysis indicates that, aside from the north-east and south-west corner balconies, most balconies are suitable for *dining*-type activities (i.e., wind speeds below 2 m/s for 95% of the time or more). Even for the corner balconies, the inner half (at least 50% of the area) remains suitable for *dining*, with 80% of the area classified as suitable for *sitting*. As expected, higher wind speeds are observed at the more exposed corners; however, over 80% of the balcony area still experiences wind speeds below 2 m/s for more than 80% of the time, and more than 95% of the balcony area experiences wind speeds below 4 m/s (corresponding to *sitting*) for 90% of the time or more. Refer to the figure below, which presents the percentage of time the wind remains below 2 m/s and 4 m/s on the south-west corner balcony—the most affected by wind (0-1 equivalent to 0-100%).

As these are privately accessed balconies, the conditions are considered acceptable, given that usage is likely to be minimal during very windy conditions. If further improvement is sought for corner balconies, one potential mitigation is to install a blade wall along one side.



Item 4

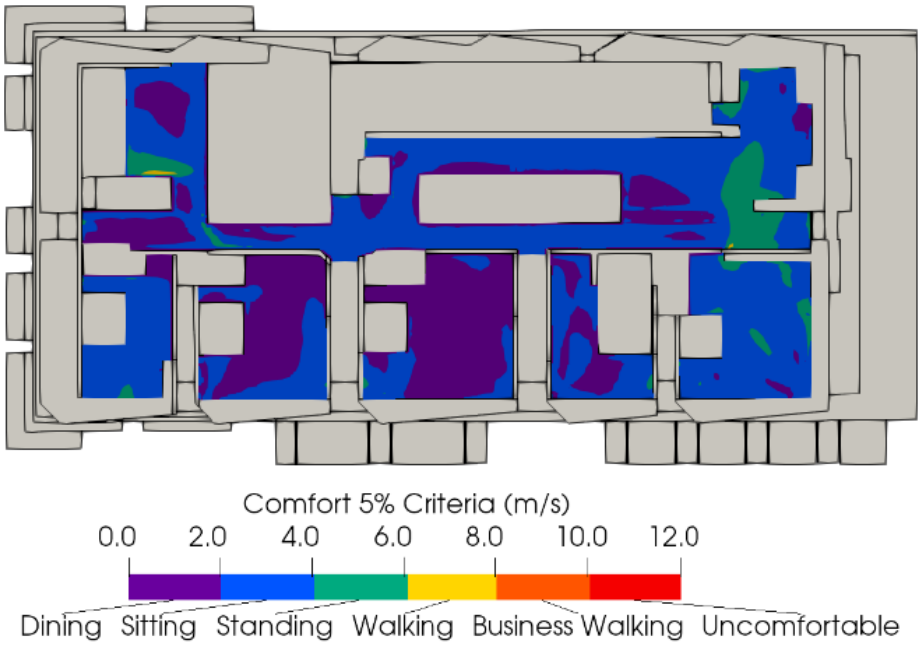
The natural ventilation of the open corridors is already discussed in detail in our report. For the natural ventilation of apartments refer to Item 2 (last item discussed).

Item 7

Not all areas on the rooftop terraces are typically intended for *sitting*-type activities. A certain degree of wind exposure and the presence of windy spots are generally expected in rooftop environments. The majority of locations on the rooftop are classified as suitable for *dining* or *sitting* activities. As such, it is intuitive that occupants would gravitate toward more sheltered areas during windy conditions, if such options are available.

That said, if areas classified as *standing* are indeed designated for seated use, there are potential mitigation strategies that could be implemented to improve wind comfort. Given that the winds at these locations are predominantly horizontal, the introduction of vertical barriers of adequate height can provide localised protection on their immediate downwind side.

For example, the location at the southern edge of the rooftop—classified as *standing*—is primarily influenced by winds from the SSW quadrant. Extending the existing vertical blade wall in this area could enhance wind conditions. Similarly, incorporating additional vertical elements through landscaping could further reduce wind impact and improve amenity. The area to the north of the rooftop classified as *standing* is affected by winds from the NNE quadrant (more frequent in summer time) is very localised and hence considered appropriate.



Item 8

The increased wind speeds observed along Hume Street are primarily the result of the combined channelling effects of Sites A and C. As such, any wind mitigation measures should be considered holistically across both sites to ensure effective outcomes. The majority of the affected areas are located along the vehicular carriageways, which are not typically intended for prolonged pedestrian use and therefore are not considered a concern from a wind comfort perspective.

While the current study has not considered the impact of the proposed street trees along Hume Street, they are expected to contribute positively by mitigating wind conditions within the affected areas. To further enhance wind comfort along the pedestrian walkway adjacent to the building on Hume Street, it is recommended that a continuous canopy be incorporated into the design of the northern frontage, wrapping around the building corners.

Item 2

Item 2 specifically discusses wintergardens and the suitability of natural ventilation of apartments. This was not part of the environmental wind assessment which assessed public areas and privately accessible open areas including podium and rooftop terraces and apartment balconies.However, since the client asked for commentary from Arup, here are some general comments:

- Most of the comments made by Che is valid and understandable. I have not seen the CFD analysis done on the wintergardens so cannot comment on that.
- There are multiple approaches to encourage natural ventilation including solutions discussed in 2a and 2b, where each having its own merits and shortcomings.

- Option 1: connect the apartments to the corridors. This could result in differential pressure and cross ventilation when the windows are open, for certain wind directions but not all the time. Different apartment in different orientation would experience different differential pressure at any given point and hence, hence different ventilation. For example, for summer time when the wind is predominantly coming from the north-east, the north and east apartments would be a better differential pressure and ventilation. A more detailed study would be required to understand the percentage of time apartments at different locations would achieve the minimum ventilation requirement.

  If the connection to the corridors is direct (though permanent or operable slots), there is a less pressure loss and hence higher ventilation rate, but could potentially have acoustic and odour issues (e.g. kitchen smell from one unit to go to corridors and other units)

  If the connection to the corridors are from false ceiling and dampers, there would be reasonable pressure loss which means without exhaust fans, it is hard to maintain the ventilation (lower percentage of time that ventilation could be achieved). And using exhaust fan would increase the complexity and cost (still much lower than split system)

- Option 2: Using permanent opening at the top and bottom of the fixed glazing system. This system is effective to relieve hot air from the top opening in scenarios where the wind pressure at both openings (top and bottom) are similar. A more detailed CFD analysis could be conducted to see if the differential wind pressure is large enough to prevent the stack effect to work. Given it's a single height space (~3.3 m ceiling height), the stack effect (buoyancy driven air movement) would be slow. The stack effect is also most effective in shallow spaces (i.e., only wintergarden) and do not be very effective, in terms of ventilation, when the space is deep (i.e., wintergarden connected to apartment) as air would not penetrate through the space enough and short circuiting would happen. Usually have openings at two sides of the apartment, would encourage more cross-ventilation. However, the permanent is effective in reducing the over heating.